

**City of Baltimore**  
Department of Public Works

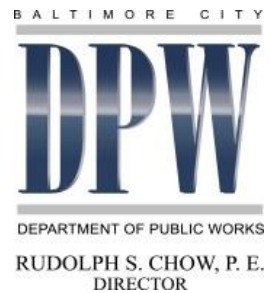
**Modified Consent Decree  
Revised Emergency Response Plan**

Sanitary Sewer Overflow Consent Decree  
Civil Action No. JFM-02-1524

February 16, 2018



CATHERINE E. PUGH  
MAYOR



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## Acronyms and Abbreviations

ARV	Air Release Valve
AS	Ammonia Screening
ATS	Automatic Transfer Switch
BCHD	Baltimore City Health Department
BOD	Biochemical Oxygen Demand
BWW	Bureau of Water and Wastewater
CCA	Community Affairs
CCTV	Closed-Circuit Television
City	Baltimore City or City of Baltimore
CMMS	Cityworks Computerized Maintenance Management System
Control One	DPW's Control One Office
DPW	Department of Public Works
EPA	U.S. Environmental Protection Agency
ERP	Revised Emergency Response Plan
FOG	Fats, Oils, and Grease
GPD	Gallons per Day
Homeowners	City Homeowners, Renters, and Other Non-Commercial Occupants
Investigator	UMD Investigator
MCC	Motor Control Center
MCD	Modified Consent Decree
MCU	Mini-camera Unit
MDE	Maryland Department of the Environment
MGD	Million Gallons per Day
MPN	Most Probable Number
NPDES	National Pollutant Discharge Elimination System
OAM	Office of Asset Management
OCAL	Office of Compliance and Laboratories
OEC	Office of Engineering and Construction
OLRA	Office of Legal and Regulatory Affairs
O&M	Operation and Maintenance

Pilot Program	Pilot Building Backup Expedited Reimbursement Program
PLC	Power-line Communication
QA/AC	Quality Assurance/Quality Control
SCADA	Supervisory Control and Data Acquisition
SDUO	Sanitary Discharge of Unknown Origin
SIS	Stream Impact Sampling
SM	Standard Method
SOP	Standard Operating Procedure
SR	Service Request
SSO	Sanitary Sewer Overflow
TSS	Total Suspended Solids
UMD	Utility Maintenance Division
VFD	Variable Frequency Drive
WQMI	Water Quality Monitoring and Investigation

## Glossary

<b>Building Backup:</b>	A wastewater or sewage release or backup into a building that is caused by blockages, flow conditions, or other malfunctions in the Collection System. A sewage backup or release is not a Building Backup if: (1) it is caused by blockages, flow conditions, or other malfunctions of a Private Lateral or other piping/conveyance system that is not owned or operationally controlled by Baltimore; or (2) is the result of overland, surface flooding not emanating from the Collection System.
<b>Collection System:</b>	Any collection and transmission system (including all pipes, force mains, sanitary sewer lines, combined sewer lines, if any, overflow structures, regulators, lift stations, pumping stations, manholes, and appurtenances thereto) owned by Baltimore City and designed to convey sewage to any treatment plant(s) or in wet weather to an overflow structure.
<b>Day or Days:</b>	Refers to calendar days. Pursuant to the Consent Decree, when a report or other deliverable is due on a Saturday, Sunday or any federal, state, or city holiday, the City has until the next calendar day that is not a holiday or weekend to submit the report or deliverable, with the exception of Sanitary Sewer Overflow reports required by Paragraph 17 of the Modified Consent Decree.
<b>Department of Public Works: or DPW:</b>	Baltimore City Department of Public Works
<b>First Responder:</b>	DPW Utility Investigator, Pollution Control Analyst, or the City's authorized designee
<b>Modified Consent Decree or MCD:</b>	Modified Consent Decree entered by the United States District Court in Civil Action No. JFM-02-1524
<b>Pumping Station:</b>	Facilities composed of pumps that lift wastewater to a higher hydraulic elevation, including all related electrical, mechanical, and structural systems necessary to the operation of that pumping station. For the purposes of the MCD, the term <i>pumping station</i> refers to the following facilities:

- (i) Eastern Avenue
- (ii) Brooklyn
- (iii) Dundalk
- (iv) Jones Falls
- (v) Locust Point
- (vi) Quad Avenue
- (vii) McComas Street
- (viii) Westport
- (ix) Stony Run

**Revised Emergency  
Response Plan or ERP:**

Revised Emergency Response Plan prepared pursuant to Paragraph 16 of the MCD.

**Sanitary Discharge of  
Unknown Origin or SDUO:**

Any discharge of sewage through the City's separate storm sewer system, where the source of the sewage is unknown. Once the source of the SDUO is confirmed, if it originates from the Collection System, it is a Sanitary Sewer Overflow.

**Sanitary Sewer Overflow  
or SSO or Overflow:**

Any spill, release, or discharge of wastewater from any portion of the Collection System, except from NPDES permitted outfalls in accordance with the applicable permit.

**Sanitary Sewer Overflow  
Structure or SSO Structure:**

Any structure constructed to allow discharge from the Separate Sanitary Sewer System at a point prior to the headworks of either the Patapsco or Back River wastewater treatment plants.



## 1.0 INTRODUCTION AND OVERVIEW

### 1.1 Introduction

#### 1.1.1 Purpose

The City of Baltimore (the City or Baltimore City) is operating its wastewater Collection System under the terms of a Modified Consent Decree (MCD) with the U.S. Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE). Paragraph 16, Revised Emergency Response Plan (ERP or Plan), of the MCD requires the City to submit a revised ERP to adequately protect the health and welfare of persons in the event of an unpermitted release, spill, or discharge of pollutants from the Collection System or in the event of a reported Building Backup.

The ERP is a reference tool to be used by City personnel during a wastewater emergency situation or reported Building Backup. It describes procedures to be followed in response to wastewater overflows within the Collection System. Pertinent response and notification procedures are outlined in this ERP, which has been developed to meet the MCD's Paragraph 16 requirements. Based on the sensitivity of utility operations and impact of providing critical infrastructure information available to the public, supplemental information will be developed for City personnel use during a wastewater emergency.

#### 1.1.2 Goals

The primary goal of the ERP is to protect the health and welfare of persons in the event of a discharge of pollutants from the Collection System. Other goals include minimization of adverse effects on the environment and protection of public health and private property. It is the intent of this Plan to provide clear guidance for:

- Locating and eliminating the source of the Overflow in a timely manner.
- Notifying impacted City agencies and departments, the general public, media outlets, and regulatory agencies.

Baltimore will review the ERP on an annual basis and update such plan as necessary. Each annual update of the ERP will be subject to EPA and MDE approval as specified in Paragraph 20, and upon EPA and MDE approval, will be incorporated into, and become enforceable under, the MCD. Baltimore will maintain a copy of the ERP required by this Paragraph on its intranet and provide a hard copy to City managers at each location designated in Section 8.0, Document Control.

Table 1-1 provides a checklist for the MCD requirements along with a reference for where in this document the requirement is met.

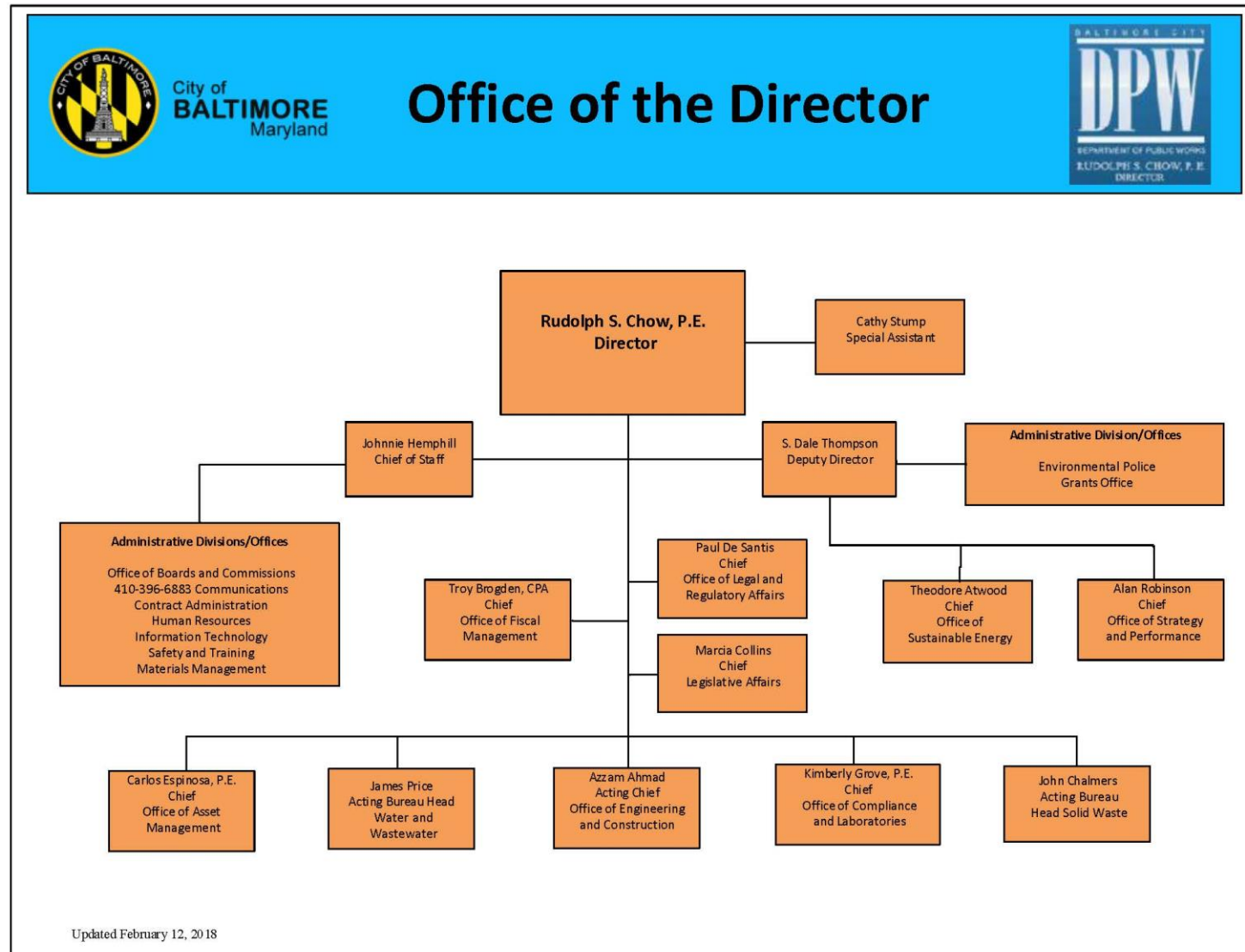
**Table 1-1: ERP MCD Requirement Checklist**

MCD Ref	MCD Requirement	ERP Plan Discussion Location
16.a.(i)	A detailed description of the actions Baltimore will undertake to immediately provide notice to the public (through the local news media, online, and/or through other means) of the unpermitted discharge of pollutants from the wastewater treatment and Collection System	Section 4.0, Collection System SSOs
16.a.(ii)	A detailed description of the actions Baltimore will undertake to provide notice to the public of SDUOs, including information on location, volumes, water bodies affected, and the impact on water quality.	Section 3.0, SDUO Notification
16.a.(iii)	A detailed description of the actions Baltimore will undertake to provide notice to EPA, MDE, state and local public health services, and other appropriate federal, state and local agencies	Section 4.0, Collection System SSOs
16.a.(iv)	A detailed plan (including the development of response standard operating procedures) to minimize the volume of untreated wastewater discharged to surface waters and to minimize overflow volumes	Section 4.0, Collection System SSOs
16.a.(v)	Identification of the personnel and resources that will be made available by Baltimore to correct or repair the condition causing or contributing to the unpermitted release, spill, or discharge	Section 4.0, Collection System SSOs
16.a.(vi)	A plan to ensure the preparedness, including responsiveness training of Baltimore employees, contractors, and personnel of other affected Baltimore agencies necessary for the effective implementation of the Emergency Response Plan	Section 7.0, Preparedness Training
16.a.(vii)	A detailed monitoring, sampling, analysis and reporting plan to determine if receiving water bodies have been adversely impacted by the discharge of wastewater associated with an overflow event	Section 6.0, Water Quality Sampling and Monitoring
16.a.(viii)	A plan for the implementation of institutional controls and actions to advise the public of, and limit access to and contact with, waterways, ground surfaces and resources affected by overflows from Baltimore's Collection System	Section 4.0, Collection System SSOs

MCD Ref	MCD Requirement	ERP Plan Discussion Location
16.a.(ix)	Identification of overflow locations within the sewershed served by each Pumping Station and those locations at which a Sanitary Sewer Overflow (SSO) is likely to occur first in the event of Pumping Station failure for each Pumping Station	Section 5.0, Pumping Station Overflows
16.a.(x)	A list of locations that overflow regularly during wet weather events and of chronic SDUOs, and procedures for posting of temporary SSO notification signs to advise the public of such overflows and discharges	Section 3.0, SDUO Notification Section 4.0 Collection System SSOs
16.a. (xi)	A detailed plan describing the standard operating procedures that Baltimore will have in place and follow in order to track, identify, respond to and relieve Building Backups as soon as possible	Section 2.0, Building Backups
16.a. (xii)	Detailed description of actions City will take to educate public through various media regarding Building Backups	Section 2.0, Building Backups
16.c.	Baltimore will maintain a copy of the revised ERP at each of its Pumping Stations	Section 8.0, Document Control

### 1.1.3 Organization

The City's Department of Public Works (DPW) oversees the implementation of the MCD. Within DPW are 18 separate administrative divisions, offices, and bureaus. Figure 1-1 presents an organizational chart for the DPW.



**Figure 1-1: Department of Public Works Organizational Chart**

## 2.0 BUILDING BACKUPS

The DPW Utility Maintenance Division (UMD) is the first responder to investigate and address sewage backups that are reported to the City. Sewage backups may have multiple causes, including, but not limited to, blockages, defects, or flow conditions in private plumbing, Private Laterals, Collection System laterals, or Collection System mainlines. The City investigates all reported sewage backups, but the City's responsibility is limited to addressing Building Backups caused by verified issues in the Collection System. These issues are addressed through the use of internal resources or through On-Call contracts with outside contractors to handle emergency projects and overflow activities. These contracts are administered by the DPW Office of Engineering and Construction (OEC) and Office of Asset Management (OAM), and may be used to supplement UMD's resources and capabilities, as needed. In addition to addressing Building Backups, the City performs education and outreach to customers regarding sewage backups.

### 2.1 Investigation Procedures

The City investigates reported sewage backups through UMD, which is under the Bureau of Water and Wastewater (BWW). Sewage backups may be reported to the City through the 311 non-emergency system (311 System). The 311 System is a central call network that is available via telephone (311) and online 24 hours a day, 7 days a week for customers to initiate sewer-related Service Requests (SRs). Each complaint in the 311 System is assigned an SR number to track the complaint from entry into the 311 System until the SR is resolved.

Sewage backup SRs are automatically forwarded from the 311 System to the Cityworks Computerized Maintenance Management System (CMMS). Upon receipt of the SR through CMMS, DPW's Control One Office (Control One) reviews the SR and contacts a UMD supervisor to assign a UMD Investigator (Investigator) to investigate the SR. Once assigned, the SR is investigated as soon as possible, but in no case later than 48 hours. The City's normal response time should be within 24 hours. Response times may depend on the personnel/resources available, distance from the complaint site, offsite emergencies, or unforeseen field conditions.

Upon arrival at the location of the complaint(s), the Investigator will distribute the City's Sewage Backup Guide to the affected premises identified in the SR, and verify if the sewage backup is a Building Backup. The Guide is available online on the DPW website. In order to be a Building Backup, a sewage backup must be caused by blockages, flow conditions, or other malfunctions in the Collection System. If the investigation determines that the sanitary sewer system serving the affected premises is owned by a third party, the customer will be notified, and the SR will be referred to the appropriate entity. For example, if UMD is called to investigate a sewage backup caused by a sanitary sewer pipe owned by Baltimore County, the City will notify Baltimore County to take appropriate action.

The Investigator will examine the Collection System mainline by checking the first downstream manhole that is closest to the affected premises. If the manhole is inaccessible or the flow is obstructed based on visual inspection, the Investigator will inspect the next downstream manhole and observe the flow. If the downstream Collection System manhole is holding water, the Investigator will check each subsequent, accessible downstream manhole until a manhole is located where the mainline is flowing freely. The area between the first manhole where the mainline is flowing freely and the closest upstream manhole holding water is the likely location of the blockage or malfunction. Once the location of the suspected mainline issue is verified, the Investigator will contact Control One to create a Work Order and notify a UMD supervisor. The Work Order will be assigned to the appropriate crew by the UMD supervisor. Mainline Work Orders are executed according to the procedures listed in Section 2.2.

If it is determined that there is no mainline blockage, the lateral of the premises identified in the SR will be inspected through the external cleanout<sup>1</sup> according to procedures listed in Section 2.3. If the external cleanout is holding water, the Investigator will contact Control One to create a Work Order and notify a UMD supervisor. The Work Order will be assigned to the appropriate UMD crew by the UMD supervisor. If the property does not have an external cleanout, the external cleanout is not accessible, or the external cleanout is not holding water, the Investigator will advise the customer to contact a licensed plumber to locate or install an external cleanout and clean the lateral from the building to the mainline. Once the customer has been notified, the SR will be closed.

Work Orders are generated for specific, verified issues that arise from the Collection System. Notably, multiple SRs may arise from a single, discrete issue in the Collection System. For example, a mainline blockage may result in multiple complaints in the 311 System, but only one Work Order may be generated to address the mainline blockage. If an investigation determines that multiple SRs arise from the same issue(s), the SRs will be linked with the corresponding Work Order. An SR is resolved when the problem has been corrected and all related Work Orders have been updated and closed in Cityworks.

## **2.2 Procedures for Addressing Mainline Blockages**

The City implements the following procedures to address Building Backups arising from mainline blockages in the Collection System:

1. A Work Order for mainline blockage is created by Control One, received by the UMD supervisor, and assigned to the appropriate UMD crew. Once a Work Order has been assigned, the City typically responds within five hours after assignment to the appropriate crew. The response timeframe may vary depending on availability of resources, offsite emergencies, distance to the location, or extreme weather events.

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<sup>1</sup> The external cleanout is a private plumbing fixture regulated by the Building, Fire, and Related Codes of Baltimore City (Building Code). Pursuant to Section 6-101 of the Building Code, the City has adopted the International Plumbing Code (2015 Edition), including but not limited to Section 708, *et seq.*



2. Once the crew arrives at the location listed on the Work Order, an attempt will be made to inform the customer that the City has arrived to address the complaint.
3. After identifying the first downstream manhole where water is flowing freely, the crew will attempt to alleviate the upstream blockage with a jet truck and/or other resources, as necessary.
4. If the crew is unable to relieve the blockage through these methods, the crew will notify Control One to create a separate, linked (child) Work Order. This may include a Work Order to implement bypass pumping. The referral will be documented, and the new Work Order(s) will be assigned by a UMD supervisor to the appropriate UMD crew or transmitted to OEC for assignment to an On-Call contractor.
5. If possible, the crew(s) will capture the debris once the blockage is removed and document the type of blockage (e.g., roots, rags, grease). The crew(s) will also document the equipment/resources used in the response.
6. Once the blockage is resolved, the crew will notify Control One to record the necessary information and create a Work Order for a Closed-Circuit Television (CCTV) inspection of the mainline. Control One will generate a Work Order for the CCTV inspection that is tagged to the original Work Order.
7. Once the CCTV crew is assigned the Work Order, the CCTV inspection will be typically conducted within 10 business days. The relevant findings from the CCTV inspection will be documented. If the CCTV inspection identifies issues that must be addressed, the CCTV crew will notify Control One to create a Work Order to address the issue(s) identified during the CCTV inspection. A UMD supervisor will assign the Work Order to the appropriate UMD crew or transmit the Work Order to OEC for assignment to an On-Call contractor for resolution.
8. Once the mainline blockage is resolved and all associated Work Orders have been performed, the Work Order(s) and associated SR(s) will be closed.

## **2.3 Procedures for Addressing Collection System Lateral Blockages**

If the Investigator determines that a Collection System lateral is experiencing a blockage, the Investigator will notify Control One to create a Work Order to address the Collection System lateral. The Work Order will be assigned to the appropriate UMD crew by a UMD supervisor. The City typically responds within five hours after the Work Order is assigned. Response times may vary based on availability of personnel/resources, offsite emergencies, distance to the location, or extreme weather events.

In the event that an acute or catastrophic failure in a lateral has caused a Building Backup, UMD will create a child Work Order and refer to a UMD construction crew or transmit it to OEC for repair and/or replacement of the laterals by the On-Call contractor.

UMD implements the following procedures to address blockages in Collection System laterals:

1. Upon arrival, the crew will search for the customer's external cleanout. If the external cleanout cannot be found, the customer must direct the crew to its location. If the customer is not home or is unavailable, the crew will leave a notice for the customer to locate the external cleanout and call Control One; or, alternatively, to contact a licensed plumber to locate/install an external cleanout and clean the lateral from the house to the mainline.
2. Once the external cleanout has been accessed, the crew will work from the cleanout using an electric machine or sewer rodder to clear any significant blockage(s) between the cleanout and the mainline. If a cutter is needed, the crew will use the small cutter head attachment until it can pass freely from the cleanout to the mainline, increasing the size of the cutter attachments until the maximum size cutter attachment for that pipe is able to pass freely to the mainline.
3. If possible, the crew will capture the debris from the blockage and document its contents.
4. After the crew has removed the blockage, the crew will insert a mini-camera unit (MCU) into the external cleanout and inspect the lateral to the mainline. If the lateral is clear, the Work Order and the SR will be closed and the customer will be notified.
5. If the MCU goes underwater during the CCTV inspection or an acute or catastrophic failure is observed, the crew will continue the CCTV as far as possible and document any relevant observations. If the failure is due to an issue in the Private Lateral, the crew will notify the customer to address the situation in the Private Lateral by hiring a licensed plumber.
6. If the inspection reveals an acute or catastrophic failure in the Collection System lateral, the crew will either address the issue or notify Control One to create a child Work Order. This may include a Work Order to implement bypass pumping. The referral will be documented and the new Work Order(s) will be assigned by a UMD supervisor to the appropriate UMD crew or transmitted to OEC for assignment to an On-Call contractor for resolution as soon as possible.
7. Once the Collection System lateral has been repaired, the crew will inspect the upstream and downstream portions of the lateral to ensure there are no identifiable blockages or malfunctions before connecting the replaced lateral segment to complete the repair.
8. If the customer is available, the crew will notify the customer that work is complete and ask the customer to test the drainage by running the water.
9. Once all assigned work regarding the Collection System lateral is performed, the Work Order(s) and associated SR(s) will be closed.

## **2.4 Public Education on Building Backups**

DPW's Communications and Community Affairs (CCA) Division performs continuous public education and outreach to help citizens understand how ratepayer funds are invested to maintain and improve the Collection System and wastewater treatment plants. As part of these



efforts, the CCA Division will disseminate information regarding Building Backups through DPW's website, brochures, and similar methods, including the following:

- News releases;
- Press conferences;
- Public events;
- Flyers, presentations, and related promotional materials distributed at meetings and events;
- DPW's website and social media accounts (e.g., Facebook, Twitter, Nextdoor, YouTube)
- Media interviews and appearances; and
- Water bill inserts and messages.

The CCA Division seeks to augment its educational material by performing outreach through multiple media in order to explain, repeat, and amplify the messaging. In order to supplement current educational resources, DPW has developed an informational Sewage Backup Guide to educate the public about Building Backups and the steps that citizens can take to report, cleanup, document, and protect themselves, as well as potential health and safety issues related to contact with sewage. In addition to this material, the Guide includes information on the City's Pilot Building Backup Expedited Reimbursement Program, as well as the General Liability Claims Process administered by the Baltimore City Law Department. The Guide is available online on the DPW website. This Guide will be distributed during sewage backup investigations as described in Section 2.1 and posted on DPW's website. The Guide will also be distributed during community events and other outreach opportunities. Where practicable, DPW's messaging regarding Building Backups will be paired with information regarding SSOs to reflect that these events often share similar causes (e.g., inappropriate disposal of fats, oils, and grease (FOG) and other non-flushable materials, root intrusion). The following section provides details on the Pilot Building Backup Expedited Reimbursement Program.

## **2.5 Pilot Building Backup Expedited Reimbursement Program**

DPW will establish a Pilot Building Backup Expedited Reimbursement Program (Pilot Program) pursuant to Appendix E of the MCD. The Pilot Program will reimburse City homeowners, renters, and other non-commercial occupants (homeowners) up to \$2,500.00 per dwelling unit, per qualifying event for reasonable, documented expenses arising from Building Backups, if a backup is the result of surcharging in the Collection System caused by wet weather events (Capacity-Related Building Backups). "Dwelling unit" will be defined as provided in Section 1-137 of the Zoning Code of Baltimore City. The Pilot Program will not apply to wet weather events that exceed the applicable level of protection established in the MCD.

The Pilot Program will begin on April 6, 2018, and run until April 6, 2021, or until a Long-Term Building Backup Expedited Reimbursement Program is approved as provided in Appendix E. Historical events that occurred prior to April 6, 2018, shall be ineligible for reimbursement. The Pilot Program shall have annual funding for reimbursement of costs of at

least \$2,000,000.00. The DPW Office of Legal and Regulatory Affairs (OLRA) shall administer the Pilot Program on the City's behalf, and will make all written determinations within 60 days of receiving all required information and documentation in support of an application for reimbursement under the Pilot Program. Reimbursement shall be limited to documented, reasonable expenses for cleanup and disinfection of interior spaces that result from a verified Capacity-Related Building Backup. Applications will be available online at DPW's website, in the DPW Customer Support and Services Division Walk-In Center in the lobby of the Abel Wolman Municipal Building, and upon request. Applications must be sent to OLRA at the following address:

Baltimore City Department of Public Works  
Office of Legal and Regulatory Affairs  
Abel Wolman Municipal Building  
200 Holliday Street  
Baltimore, MD 21202  
[reimbursement@baltimorecity.gov](mailto:reimbursement@baltimorecity.gov)

Applications will be accepted by email, U.S. Mail, or an equivalent method of commercial delivery. Applications will be processed in the order they are received, and all applications will be finalized for acceptance or denial, provided that all supporting documentation and information is received from the applicant. If multiple applications are received for the same dwelling unit for expenses arising from the same event, the initial reimbursement (if any) will be subtracted from the aggregate \$2,500.00 limit for all subsequent applications pertaining to the same event for the same dwelling unit. If an application is missing necessary information, OLRA will notify the applicant in writing if contact information is available. The application may be denied if the applicant fails to provide the necessary information within 365 days after notice from OLRA, provided that homeowners with insurance determinations pending may supplement their application as provided below.<sup>2</sup>

The Pilot Program will be advertised through various media, including the DPW website, community outreach events, and billing inserts. The guide will also be distributed to customers when the City responds to sewage backups as described in Section 2.1. In addition to the requirements stated above and provided in Appendix E, the homeowner must notify the City through the 311 system within 24 hours of discovering the Capacity-Related Building Backup. The homeowner must also file an application with OLRA at the address provided above within 90 days of discovering the Capacity-Related Building Backup. Notification and timely submittal are necessary to allow the City to document, investigate, and respond appropriately.

If a homeowner has an insurance policy that covers Building Backups, the insurance coverage must be used to its limit before the incident may be eligible for reimbursement. Cleanup and disinfection expenses covered by insurance are not eligible for reimbursement. Insurance deductibles may be eligible for reimbursement, provided that OLRA receives documentation to

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<sup>2</sup> Failure to provide any documentation in a timely manner may not extend any applicable notification required by law or any applicable statute of limitations.

demonstrate that the costs incurred were reasonable and related to disinfection and cleanup arising from a Capacity-Related Building Backup. Although applications must be received by OLRA within 90 days after the incident, the homeowner may supplement the application with insurance-related documentation once a final determination is received from the insurance company. Applications with an insurance claim pending will be held in abeyance until the homeowner's insurance company issues a final determination, provided that the insurance documentation must be received by OLRA within 30 days after the homeowner receives the final determination from the insurance company.<sup>3</sup>

If OLRA determines that an application is eligible for reimbursement, OLRA will provide the homeowner with a final, written determination and include a release for signature. OLRA will not authorize reimbursement for any application until a signed release is received. Upon receipt of a signed release, OLRA will initiate the payment process. All payments will be issued by the Baltimore City Department of Finance in accordance with the City's established procedures. OLRA will track applications received under the Pilot Program, including (1) the date of the incident; (2) the amount requested; (3) the determination and associated rationale; and (4) the date of each determination. This data will be reported annually in the 3<sup>rd</sup> Quarterly Report beginning in 2019. OLRA will collaborate with the DPW Office of Fiscal Management and the Baltimore City Department of Finance to maintain proper accounting and documentation regarding funds disbursed under the Pilot Program.

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<sup>3</sup> Failure to provide any documentation in a timely manner may not extend any applicable notification required by law or any applicable statute of limitations.

### 3.0 SDUO NOTIFICATION

The DPW Office of Compliance and Laboratories (OCAL) is responsible for investigating and tracking the elimination of illicit discharges to the storm sewer system. If an illicit discharge appears to be related to sewage, based on visual and chemical indicators, but the source(s) cannot be identified, then the discharge is designated as a sanitary discharge of unknown origin (SDUO) for further investigation. The City's investigation and tracking procedures are included in the SDUO Plan, which was submitted to EPA and MDE on February 2, 2018. Within 24 hours of designation of an SDUO, the OCAL field personnel shall notify the DPW Communications and Community Affairs Division Chief.

The notification shall provide the location of the discharge (outfall location), estimated discharge rate, stream name, and 8-digit watershed. Upon receipt, the DPW Communications and Community Affairs Division Chief (or designee) will post a notice on the DPW website with this information. The posted notice will also remind the public of the impact on water quality.

Within 48 hours of the SDUO designation, OCAL field staff shall post temporary SSO notification signs at the outfall location until the SDUO is abated. OCAL will post new temporary signage within a reasonable time after discovery if the signs are damaged or removed by a third party. For outfalls with chronic SDUOs, OCAL field staff shall post permanent signage at the outfall until the SDUO is abated. Signs will be placed to maximize public outreach in consultation with the Health Department as appropriate. An outfall may be considered as having chronic SDUOs if the following conditions are encountered:

- SDUO lasts more than 90 days; or
- Multiple SDUOs have been found in the outfall's drainage areas for the last two years.

A list of outfalls with chronic SDUOs shall be maintained and updated in the MCD quarterly report.

## 4.0 COLLECTION SYSTEM SANITARY SEWER OVERFLOWS

### 4.1 Public Notification

In the event of a confirmed SSO, the City initiates a coordinated effort between DPW and the Baltimore City Health Department (BCHD) to respond promptly and appropriately to the SSO. Press releases will be issued as soon as possible once an SSO is confirmed to equal or exceed 10,000 gallons, or as otherwise determined by the Chief of DPW Communications and Community Affairs Division or BCHD. Internal notification protocols are provided in Section 4.4.1. In addition to the press release, the City will issue a notice on the DPW website that identifies the location and estimated volume of the discharge. These notices will include the adverse impact on water quality. Notifications may also be shared on DPW's Twitter feed and disseminated via other social media tools. The City's procedures for notifying EPA, MDE, and BCHD are detailed in Section 4.4.1. As noted in Section 6, the presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water, and there are no designated locations in Baltimore City for full-body contact recreation in surface water.

### 4.2 List of Locations that Overflow Regularly

The City has identified six locations where SSOs are likely to occur during wet weather events. If an SSO occurs, DPW will post temporary SSO notification signs to notify the public in consultation with BCHD, as appropriate. The severity of the overflow at these locations depends on a number of factors, including rain event intensity, distribution, footprint, and time of day. Table 4-1 lists the six overflow locations.

**Table 4-1: List of Overflow Locations**

	Overflow Location	Zip Code	Sewershed
1	1911 Falls Road (front of Streetcar Museum)	21211	Jones Falls
2	1124 Armistead Road	21205	Herring Run
3	2121 Wicomico Road	21230	Low Level
4	1731 Chase Street	21213	High Level
5	1715 E. Eager Street	21213	Outfall
6	1700 Block South Clinton Street	21224	Low Level

### **4.3 Available Resources and Preparedness Training**

The City maintains various personnel and resources to respond to SSOs. The DPW UMD is the first responder to investigate and address overflows that are reported to the City. UMD maintains various resources to address SSOs, including vacuum trucks, CCTV equipment, jetter trucks, backhoes, dump trucks, bypass pumps, power generators, and numerous vehicles. The DPW OEC also has available on-call contractors to supplement UMD's resources as-needed. The DPW OAM provides technical support to UMD and OEC.

In 2015, DPW implemented a field SSO reporting software application. This application is designed to record the details of an SSO event, capture images, and generate the 5-Day Reports prescribed by Paragraph 17. DPW also monitors response and reporting procedures for SSO events through an internal SSO Compliance Team. The Team coordinates the submittal of 5-Day Reports and provides support and training to First Responders and other staff involved in SSO response. The Team also performs root-cause analysis of SSO events, and determines and coordinates necessary repairs to prevent re-occurrence.

In addition to these duties, the SSO Compliance Team coordinates SSO response training every year. The training is attended by staff from various offices and divisions within DPW, including the DPW OCAL, the DPW Division of CCA, UMD, and OAM. Section 10 details the curriculum and procedures for Preparedness Training.

### **4.4 Minimizing SSO Volume, Implementing Institutional Controls, and Notifying EPA, MDE, and BCHD**

The City's objective is to minimize overflow volume by abating SSOs as soon as possible. If the situation requires additional resources and time to stop the discharge, crews may install bypass pumping to abate the SSO. The City's Standard Operating Procedure (SOP) for SSO events is provided below, and the City's procedures for SSOs caused by Pumping Stations are prescribed in Section 5. In addition to the reactive procedures detailed in this ERP, the City has implemented numerous proactive maintenance programs and projects to minimize the number and volume of SSO events. These programs include FOG control, root control, cleaning and lining, root cause analysis of SSOs with needed repairs, and capital projects, including those identified in Appendix B of the MCD. These initiatives have yielded favorable results as evidenced by a continued reduction of SSO events over time.

#### **4.4.1 SSO Standard Operating Procedure**

##### **PURPOSE**

This SOP provides general procedures for investigating and abating SSOs in order to minimize overflow volume and implement institutional controls to advise the public and limit access to SSO sites. In addition, this SOP provides standard procedures to report SSOs to EPA, MDE, and the Baltimore City Health Department.



## PROCEDURE

### 1. Fielding Complaints Received via 311

- 1.1. The SSO complaint is received in the 311 Call Center via phone, the online 311 application, or the City's mobile application for initiating customer complaints.
- 1.2. Upon receipt, the 311 Call Center creates an SR in the Customer Service Request system. The SR is automatically transferred to Cityworks, where Control One will notify a DPW Investigator to evaluate the location of the complaint.
- 1.3. The Investigator typically arrives at the complaint location within one (1) hour of notification from Control One. Response time may vary due to simultaneous emergencies elsewhere in the Collection System, drinking water distribution system, or storm drain system. If so, the extenuating circumstances will be documented, and the time elapsed will be accounted for in determining SSO volume (if any) as provided in Paragraph 17.
- 1.4. If the overflow location cannot be found, the Investigator will notify Control One.
  - 1.4.1. Upon notice, Control One will contact the customer to obtain additional information regarding the location of the overflow. The customer may also be invited to meet the Investigator on-site.
  - 1.4.2. If Control One is unable to reach the customer, Control One will document the efforts that were made to contact the customer and close the SR until further location information is received.

### 2. SSO Investigation

- 2.1 If an SSO is confirmed, the First Responder<sup>4</sup> will:
  - 2.1.1 Document the time when the First Responder confirmed the occurrence of the SSO, which will be used as the start time for duration and volume calculations.<sup>5</sup>

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<sup>4</sup> First Responders may include Investigators, Pollution Control Analysts or similar City personnel, who may identify SSOs while performing routine field work.

<sup>5</sup> If the First Responder is investigating an SSO complaint and arrives at the location over an hour after the complaint was received, the 5-Day Report will include the elapsed time beyond 1 hour in the SSO volume estimation. The City will also consider any time-and-date-stamped video or photo of the SSO that is produced by a third party prior to submittal of the 5-Day Report, provided that the video/photo is helpful in assessing the SSO's duration and volume as determined by the DPW Office of Asset Management.

2.1.2 Notify Control One. Control One will notify the Sewer Maintenance Supervisor of the SSO.<sup>6</sup>

2.1.3 Photograph the area.

2.2 The Sewer Maintenance Supervisor will notify Control One to create Work Order(s) as-needed. If the Sewer Maintenance Supervisor deems it necessary, bypass pumping may be implemented.

2.3 Once the Sewer Maintenance Supervisor has investigated the SSO location, the Supervisor will notify the Wastewater General Superintendent.

### 3. SSO Notifications and Reporting

3.1 If an active SSO is confirmed or the Sewer Maintenance Supervisor determines that an inactive SSO reached or is likely to reach the storm drain system or surface water, the Sewer Maintenance Supervisor<sup>7</sup> will contact MDE,<sup>8</sup> BCHD, and OCAL within 24 hours of confirming the event.

3.2 If the SSO is confirmed to equal or exceed 10,000 gallons, the Wastewater General Superintendent will immediately contact MDE, BCHD, the Chief of DPW Communications and Community Affairs, and OCAL. Water quality sampling will be conducted in accordance with Section 6 of this ERP. Press releases will be issued as provided in Section 4.1.

3.3 Regardless of the SSO's volume or status (e.g., active or inactive), the Wastewater General Superintendent will determine if there are establishments with potentially sensitive populations (e.g., schools, day care centers, hospitals) that may be subject to exposure in the immediate area of the overflow. If so, the Wastewater General Superintendent or his/her designee will personally notify these facilities of the situation as soon as possible.

3.4 Within one working day after the SSO is confirmed, OAM will review the relevant information pertaining to the SSO. If a pipe repair or replacement was required to abate the SSO, OAM will monitor the progress of the repair. The 5-Day Report will be sent to the Bureau Head of Water and Wastewater for approval and dissemination to EPA and MDE in accordance with Paragraph 17 of the MCD. If the SSO is on-going, the 5-Day Report will state this, and an amended report will be submitted within 5 days after the SSO is abated.

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<sup>6</sup> Between the hours of midnight and 8:00 a.m. when the Sewer Maintenance Supervisor is off-duty, Control One will contact the Wastewater General Superintendent.

<sup>7</sup> The DPW Office of Engineering and Construction will make this notification for overflow events at SSO Structures.

<sup>8</sup> MDE must be contacted at 410-537-3510 (after hours: 1-866-633-4686) **within 24 hours**.



#### 4. Overflow Relief and Institutional Controls

- 4.1 The Sewer Maintenance Supervisor will determine the immediate discharge location of the SSO (e.g., storm drain, contained ponding, street curb gutter, body of water).
- 4.2 The Sewer Maintenance Supervisor will request necessary materials and equipment to contain or isolate the overflow to the maximum extent practicable. The Supervisor's ability to contain the overflow is dependent, in part, on the rate of discharge, weather conditions, and ongoing flow through the Collection System. The overflow may be contained with sandbags, recovered with a vacuum truck, diverted to a downstream sanitary sewer manhole, or otherwise contained as determined by the Sewer Maintenance Supervisor.
- 4.3 The area affected by the SSO must be marked with cones, yellow caution tape, or similar measures to advise the public and limit access as practicable. If the SSO is in an area with vehicular traffic, UMD may set up emergency traffic control. Additional site controls may be implemented as determined by BCHD. Temporary SSO notification signs (Figure 4-1) will be posted if the criteria below are met:
- The overflow is inside or within 100 feet of a designated public recreation area (i.e., park, ball field, playground, Dog Park, school yard, trail).
  - The overflow is within 50 feet of a waterway, stream, or wetland.
  - The overflow is within 50 feet of a building, and direct contact is likely.



Figure 4-1: Temporary SSO Notification Sign

- 4.4 Photographs must be taken to document that institutional controls were implemented.
- 4.5 The Sewer Maintenance Supervisor or designated field crew will investigate the mainline manholes upstream and downstream of the SSO location. Once the first clear downstream manhole (i.e., not surcharging and free flowing) is located, the field crews will begin work to alleviate the blockage in the mainline. Additional resources may be requested as determined by the Sewer Maintenance Supervisor. If necessary, CCTV may be performed to assess the nature of the blockage.
- 4.6 If the Sewer Maintenance Supervisor determines that bypass pumping is needed, s/he will request assistance from the Pump Truck Crew and/or the OEC.
- 4.7 Once the choke is relieved and the SSO has ceased, the Work Order will be closed. Once the Work Order(s) are closed, the Service Request(s) associated with the SSO will also be closed.

## 5. Cleanup of SSO Site

- 5.1. The SSO site will be cleaned within two (2) working days after the condition that gave rise to the SSO is repaired. If the SSO was related to wet weather, the SSO site will be cleaned up within two (2) working days after the wet weather event has ended.
- 5.2. If sewage is pooled, the liquid will be removed to the maximum extent practicable and disposed of in the Collection System, as appropriate. Solids and viscous materials should be collected as provided below.
- 5.3. If practicable, the area may be flushed. Solids and debris will be collected and transported for appropriate disposal in the Collection System or as solid waste. No readily identifiable residue (e.g., sewage solids, paper, rags, plastics, rubber products) should remain.
- 5.4. Where appropriate, the site will be disinfected and deodorized by applying lime to the affected area. Typically, lime is used on permeable surfaces (e.g., grass/topsoil).
- 5.5. Unless otherwise directed by BCHD, the institutional controls will be removed once the cleanup is complete. The temporary SSO notification signs will be removed as follows:
  - 5.5.1. If the SSO is confirmed to equal or exceed 10,000 gallons, the temporary SSO notification sign(s) will be removed when water quality sampling performed by OCAL determines that receiving surface waters have returned to ambient conditions. If the SSO has not affected a body of water and/or water sampling is not feasible, the sign(s) will be removed

after 30 days unless a longer period is necessary as determined by BCHD or the Sewer Maintenance Supervisor.

5.5.2. If the SSO is less than 10,000 gallons, the temporary SSO notification sign(s) will be removed after 14 days unless a longer period is necessary as determined by BCHD or the Sewer Maintenance Supervisor.

5.6. Depending upon the cause of the overflow, follow-up CCTV inspection may be performed as determined by OAM. If necessary, additional corrective action(s) will be recommended by OAM and coordinated with UMD, on-call contractors, or OEC, as appropriate.

## 5.0 PUMPING STATION OVERFLOWS

### 5.1 Introduction

Within DPW, BWW is responsible for the operation and maintenance (O&M) of all wastewater collection and treatment assets. Within BWW, the Wastewater Facilities Division oversees the O&M of pumping stations as listed in Table 5-1.

**Table 5-1: Wastewater Pumping Stations**

Station	Location	Maximum Design Pumping Capacity (MGD) <sup>a</sup>	Relevant Section
Eastern Avenue	751 Eastern Avenue	100	Section 5.4.1
Brooklyn	3404 S. Hanover Street	12.4	Section 5.4.2
Dundalk	2203 Broening Highway	33.3	Section 5.4.3
Jones Falls	3600 Ash Street	55	Section 5.4.4
Locust Point	2290 E. Fort Avenue	3.6	Section 5.4.5
Quad Avenue	701 North Point Road	30	Section 5.4.6
McComas	1800 Key Highway	1.44	Section 5.4.7
Westport	2911 Waterview Avenue	3.5	Section 5.4.8
Stony Run	2840 Sisson Street	17	Section 5.4.9

<sup>a</sup> MGD – Million gallons per day

In the event of emergencies concerning any of the above-listed pumping stations, an internal communication protocol has been developed. Regardless of the pumping station experiencing the emergency, this communication protocol can be used by all City personnel responding to emergencies. Table 5-2 lists the key individuals in the communications protocol.

**Table 5-2: Emergency Contact List (in order of notification)**

Emergency Contact List	
Name:	Chris Stielper
Organization:	Baltimore Department of Public Works
Title:	Manager of Pump Station Operations & Maintenance
Name:	Mike Gallagher
Organization:	Baltimore Department of Public Works
Title:	Chief, Wastewater Facilities
Name:	James Price
Organization:	Baltimore Department of Public Works
Title:	Bureau Head, Bureau of Water and Wastewater

Emergency Contact List	
Name:	Rudolph S. Chow
Organization:	Baltimore Department of Public Works
Title:	DPW Director

Figure 5-1 depicts a decision flow chart for notification and response in the event of pump station emergencies.

Section 5.2 (Tables 5-3 through 5-11) contains station-specific emergency response procedures, and Section 5.3 contains general emergency procedures for force mains.

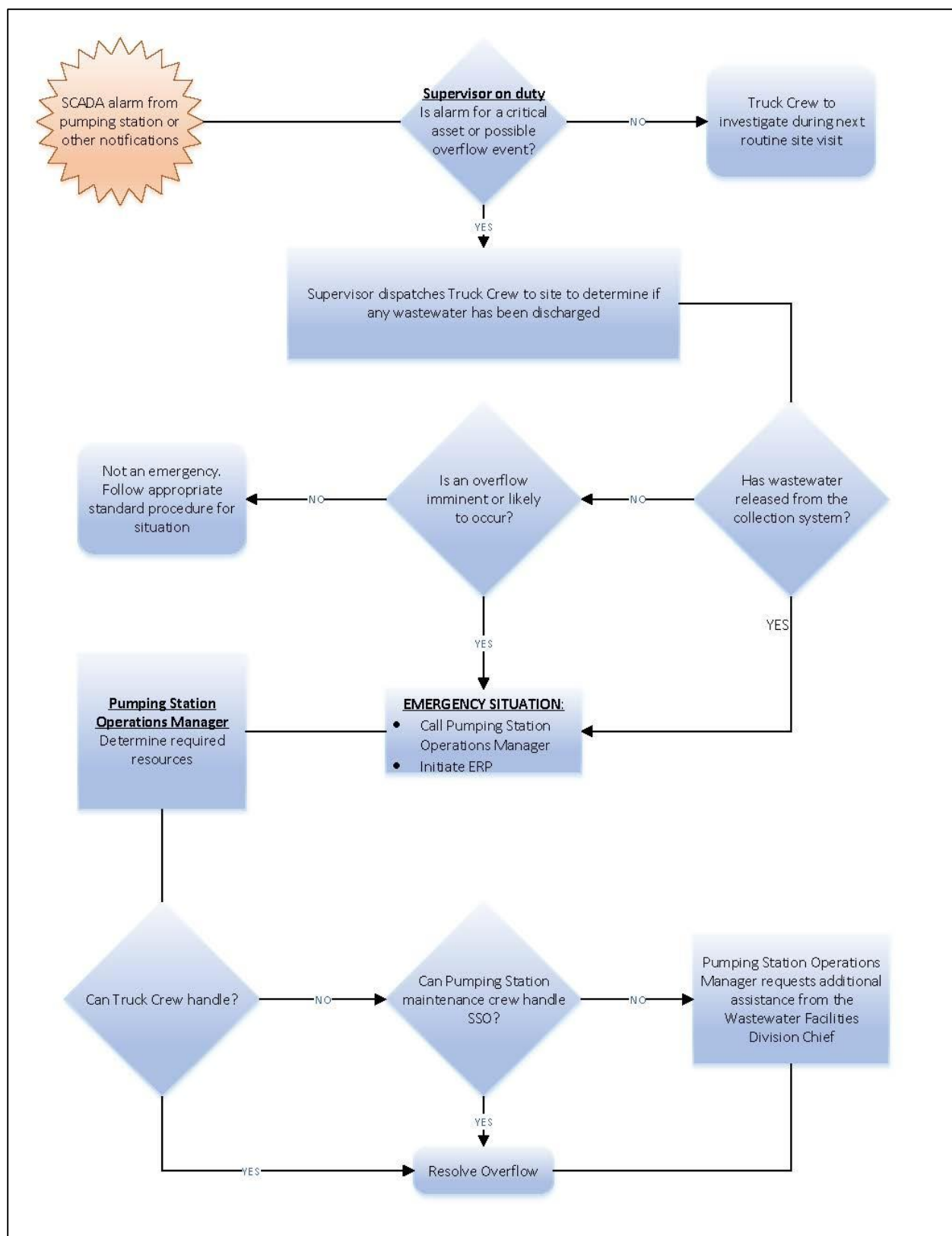


Figure 5-1: Pump Station Emergency Decision Chart

## 5.2 Station-Specific Emergency Response Procedures

### 5.2.1 Eastern Avenue Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 751 Eastern Avenue, Baltimore. Fire/EMS access to Generator Building by gate on Fleet Street opposite the Marriott Hotel. Generator building is on your right.

**Table 5-3: Eastern Avenue Pumping Station Data**

Eastern Avenue Station	
Station Address:	751 Eastern Avenue, Baltimore, MD 21225
Station Telephone No.	(410) 396-4972
First Likely SSO Point	Manhole on intersection of President St./Eastern Ave.
(Channel) Storage Capacity	Approximately 500,000 gallons; limited in-line storage
Est. Generator Run Time:	Approximately 24 hours, depending on flow
Influent Flow Rate	Estimated Storage Time
Minimum: 18 MGD	Approximately 40 minutes
Average: 22 MGD	Approximately 30 minutes
Maximum: 100 MGD	Approximately 5 minutes

- **Station:** The station is continuously staffed and is the control point for the Supervisory Control and Data Acquisition (SCADA) system.
- **Redundant power:** Station is equipped with dual utility feeders with automatic transfer switchgear, two 2,000 kilovolt-ampere emergency generators. Duplex emergency generators support full station hydraulic capacity.
- **Portable gas detection:** Portable gas detection equipment is stored in the Electrical Room.
- **Pumps:** Five electric drive sewage pumps available, with sixth diesel drive emergency overboard pump.
- **Force main:** Three force mains in service.
- **Emergency bypass availability:** The nearest structure to bypass into would be the Main Outfall Interceptor several miles west of the station along Eastern Avenue. This will require the use of an on-call pumping contractor.
- **Likely collection system overflow point:** The first indication of an SSO will be within the station as the wet well overflows and floods the boiler room. If the surcharge scenario continues unabated, the Collection System will experience an SSO in the

multiple manholes in the “Little Italy” neighborhood immediately east of the station. The structure that is likely to experience an SSO first (outside the pump station) is the sanitary sewer manhole at the intersection of Eastern Avenue and President Street.

### Electrical Fault

1. Does the station have power?

- Verify the station has power on all three phases by checking the metering on the 480-volt switchgear at the pump station. Voltage should read 480 volts +/- on all three phases.
- If power is not present on all three phases, immediately request an electrician to respond. The station switchgear should only be operated by a qualified electrician.
- Loss of one of the two utility feeds should automatically transfer load to the energized feeder. If both utility feeders fail, the station generators should start and transfer load. If manual starting of the generators is required, this can only be done by *authorized personnel* at controls in the Generator Building.

2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the motor control center (MCC).
- Check that the motor starters have power on all three phases. In the event of failure of the soft-start control failure, the equipment should automatically revert to auxiliary direct-on-line starters.
- Check for power to the seal water pumps and vacuum prime pump system. Check for vacuum on the common vacuum header gauge. Remember that the pumps cannot start on bubbler wetwell level control unless and until the vacuum prime and seal water pumps are operating.

### Mechanical Fault

1. Is the pump operating deck flooded?

- Visually check the pump deck. At the Eastern Avenue Station, any leak in the vicinity of the sewage pumps will be readily apparent. Any leak or breakage in the force main header may occur within the force main header structure in front of the station along Eastern Avenue. The first indication of a break within this structure may be surcharging and an SSO in the area.
- Immediately stop the affected sewage pump. In most cases it should be possible to isolate the leak or break by closing the appropriate valves as described in the station O&M Manual.

2. Is there a high Screening Channel Alarm, with or without a collection system SSO?

- First, verify this condition by manually inspecting the Screening Channel.



- A high level in the Screening Channel indicates that the sewage pumps are not operating, or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating. Attempt manual start of any one electric pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 120 seconds travel time) after starting the pump.
  - If the pump motors are running and no/low flow is indicated on the station flowmeter, investigate valve positions, including cone and isolation valves, and verify that the pump couplings are intact. Attempt to return at least one pump to service.
3. Is there a low wetwell alarm, with or without a collection system SSO?
- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/ obstruction of both units would be unlikely. Check the bar screen circuit breakers located in the switchgear room. During normal daytime dry-weather flows, any one screen can accommodate station flow, so isolating one of the two screens is an option. It is not possible to bypass the screening channel entirely at the Eastern Avenue station.

#### **Instrumentation and Control Fault**

Alarm conditions as displayed at the operator’s control station are self-explanatory. See the Eastern Avenue Station O&M Manual for troubleshooting and repair of specific systems.

Eastern Avenue Station local control is provided by the station programmable logic control (PLC). This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube screening channel level control system.

## 5.2.2 Brooklyn Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 3404 South Hanover Street, Baltimore. Brick structure; nearest intersection is South Hanover St. and Frankenfurst Avenue Enter station from South Hanover driveway.

**Table 5-4: Brooklyn Pumping Station Data**

Brooklyn Station	
Station Address:	3404 Hanover Street, Baltimore, MD 21225
Station Telephone No.	(410) 396-9497
First Likely SSO Point	First manhole upstream from the Pumping Station on S. Hanover Street
Storage Capacity	Approximately 80,000 gallons (wetwell); limited in-line storage
Est. Generator Run Time:	Approximately 2-1/2 days
Influent Flow Rate	Estimated Storage Time
Minimum: 1.73 MGD	Approximately 1 hour, 7 minutes
Average: 1.93 MGD	Approximately 1 hour
Maximum: 15.00 MGD <sup>a</sup>	Approximately 8 minutes

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and automatic transfer switch (ATS) for station service.
- **Pumps:** Two pumps with third standby/wet weather pump available.
- **Force main:** Alternate force main available.
- **Emergency bypass availability:** Flow can be diverted by pumping to the nearest gravity sewer manhole located on South Hanover Street, 530 feet south of the station on the west side of the street.
- **Likely collection system overflow point:** First manhole upstream from the pumping station on South Hanover Street.

### Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located in

the station control room. If power is not present on all three phases, immediately request an electrician to respond.

- Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, *and* the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS.
2. Do the pumps and auxiliary equipment have power?
    - Check that all circuit breakers are closed at the MCC. Remember that the pumps will not start on radar/bubbler wetwell level control unless and until the vacuum prime and seal water pumps are operating.

### **Mechanical Fault**

1. Is the drywell flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating.
  - Attempt manual start of the standby/wet weather Pump #3. Check the wetwell level control systems: if these are inoperative, sewage pumps may be started manually at the MCC.
  - If the pump motors are running, investigate valve positions, including check valves, and verify that the pump couplings are intact. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.
3. Is there a low wetwell alarm, with or without a collection system SSO?
4. Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Brooklyn Station O&M Manual.
  - If the bar screen is operating and there is low flow in the influent channel, investigate for an upstream gravity sewer break or obstruction.

**Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Brooklyn Station O&M Manual for troubleshooting and repair of specific systems.

The Brooklyn Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Brooklyn Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on a single pump. Pump #3 will operate independently on wetwell float control.

If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.3 Dundalk Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2203 Broening Highway, Baltimore. Driveway is 200' north of the intersection of Broening Highway and Keith Avenue.

**Table 5-5: Dundalk Pumping Station Data**

Dundalk Station	
Station Address:	2303 Broening Highway, Baltimore MD 21224
Station Telephone No.	(410) 396-7287
First Likely SSO Point	Manholes, immediate vicinity of the station
Storage Capacity	Approximately 150,000 gallons (wetwell); limited in-line storage
Est. Generator Run Time:	14 to 15 hours
Influent Flow Rate	Estimated Storage Time
Minimum: 8.10 MGD	Between 1 to 1-1/2 hours
Average: 9.82 MGD	Approximately 1 hour
Maximum: 33.00 MGD	Approximately 18 minutes

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual utility feeders and emergency generator.
- **Three-gas detection system:** Alarm visible from outside of building near door.
- **Pumps:** Four identical sewage pumps available.
- **Force Main:** Reserve 36-inch force main available.
- **Emergency bypass availability:** Portable pumps can be used to pump from the wet well to the pump-around connection on the 36-inch force main and will require a manifold and valve installed. An access hatch is located on the south side of the station. One bypass option for this station if the sewage pumps are operable is to return the reserve (old) force main to service by closing the gate valve to the service force main and opening the 24-inch to the reserve (old) force main.
- **Likely collection system overflow point:** Manhole in the Trucking School parking lot, west of Dundalk Station.

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking the metering on the switchgear. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - The station switchgear should only be operated by a qualified electrician. Loss of any or all phases should automatically start the station generator and transfer load. If manual starting of the generator is required, this can only be done by controls on the ATS in the switchgear room.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Single-phase loads have circuit breakers located in Panel L. Remember that the pumps cannot start on radar/bubbler wetwell level control unless and until the vacuum prime and seal water pumps are operating. Bypass switches are provided on all variable frequency drives (VFDs).

## Mechanical Fault

1. Is the drywell flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - The pump drive motors are not submersible. If the drive motors have been submerged, do not attempt to start them until they have been inspected by a qualified electrician. Begin planning for emergency bypass pumping.
  - Any substantial leak caused by pipe breakage may require dewatering the drywell by vacuum truck.
2. Is there a high wetwell alarm, with or without a collection system SSO?

**Note:** Dundalk Station is equipped with an auxiliary float system in the wet well to automatically run pumps at high wet well alarm levels.

- This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating by checking the pressure and vacuum gauges, respectively.
- Attempt manual start of any one pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 90 seconds travel time) after

starting the pump. If the pump motors are running and no/low flow is indicated on the station flowmeter, investigate valve positions, including the plug and cone valves, and verify that the pump couplings are intact.

- Attempt to return at least one pump to service.

3. Is there a low wetwell alarm, with or without a collection system SSO?

- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/ obstruction of both units would be unlikely. Check the bar screen circuit breakers located in Panel WW in the switchgear room.
- Any one screen can accommodate station flow, so isolating one of the two screens is an option. As a last resort, the screen channel may be bypassed entirely with flow entering the wetwell from the influent bypass structure. This procedure should be undertaken only in an emergency. Unscreened solids entering the wetwell will eventually rag and disable the pumps. The screening channel bypass procedure is described in the Dundalk Station O&M Manual.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Dundalk Station O&M Manual for troubleshooting and repair of specific systems.

The Dundalk Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Dundalk Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the float wetwell level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.4 Jones Falls Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 3400 Ash Street, Baltimore. West of the intersection of Clipper Mill Road and Ash Street.

**Table 5-6: Jones Falls Pumping Station Data**

Jones Falls Station	
Station Address:	3400 Ash Street, Baltimore MD 21211
Station Telephone No.	(410) 396-6579
First Likely SSO Point	None (station has 27" overflow relief gravity sewer) <sup>a</sup>
Storage Capacity	51,700 Gallons (wetwell); 125,000 gallons (in-line storage)
Est. Generator Run Time:	Indefinite (natural gas fuel)
Influent Flow Rate	Estimated Storage Time
Minimum: 13.0 MGD	20 minutes
Average: 17 MGD	15 minutes
Maximum: 42 MGD <sup>b</sup>	6 minutes

<sup>a</sup> Low point of the 27-inch relief sewer located at 1911 Falls Road., immediately west of RR overpass.

<sup>b</sup> Highest flow recorded.

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual primary utility feeders, and emergency natural gas fired generator and ATS for station service.
- **Pump:** Three pumps are available—two in alternating service and the third standby/wet weather.
- **Force main:** Two usable force mains—30 inch (standby) and 36 inch (service).
- **Emergency bypass availability:** In the event the wetwell overflows, the surcharge will have to be pumped to the nearest gravity sewer manhole. There is a 27-inch bypass relief sewer that can take some of the overflow. The station is provided with an emergency (additional) wetwell.
- **Operational note:** In dry weather conditions, flow will normally bypass the station to the 27-inch relief sewer. This sewer may become surcharged during some wet-weather events, resulting in loss of hydraulic capacity and a possible high wetwell level condition.
- **Likely collection system overflow point:** Because there is a bypass sewer that relieves the station overflow chamber, the first likely SSO point is the SSO #67 structure at 1911 Falls Road. Any flow from this point will enter Jones Falls.



## Electrical Fault

### 1. Does the station have power?

- Verify the station has utility power present on all three phases of the three-phase services. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond. It is unlikely that both 13.8-kilovolt feeders would be de-energized at the same time. Do not attempt to operate the primary power switchgear.
- Loss of one of utility power on both primary feeders will cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of both 13.8-kilovolt feeders and the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Jones Falls Station O&M Manual.

### 2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the MCC. In the unlikely event both bubbler tube systems and float switch wetwell level controls are disabled, pumps can be started manually at the VFDs as long as three-phase power is available at the MCC. The pump seal water systems are interlocked through the VFD, and should start before the pump starts on time delay. After starting pump, verify that the pump discharge valve *to the desired force main* (36 inch or 30 inch) has opened.
- Check for power for single-phase 120-voltloads at Panels LP-1 through LP-4. Upon loss of power to the PLC, the station will automatically switch to bubbler tube level control.

## Mechanical Fault

### 1. Is the drywell flooded?

- Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pumps to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
- Note that the pump motors and related equipment are not submersible equipment. Do not attempt to re-energize this equipment if it has been submerged. The motors and related electrical connections must be inspected by a qualified electrician prior to returning them to service.

### 2. Is there a high wetwell alarm, with or without a collection system SSO?

- This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the

pumps are operating and three-phase power is available, check the wetwell level control systems. If both bubbler tubes systems and the float controls are inoperative (unlikely), sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate the pump couplings and valve positions, including the pump suction plug and outlet cone valves. Attempt to return at least one pump to service.

3. Is there a low wetwell alarm, with or without a collection system SSO?

- Investigate the bar screens and screening channels. If one or the other screen is fouled or otherwise inoperative and cannot promptly be returned to service, isolate and bypass the screening channel using the procedure in the Jones Falls Station O&M Manual.
- If the screens are operating and there is low flow in the screening channels, investigate the 48-inch upstream gravity sewer for a break or obstruction.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Jones Falls Station O&M Manual for troubleshooting and repair of specific systems.

The Jones Falls Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Jones Falls Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on bubbler tube level control.

In the event of PLC failure, the station shall be staffed until the PLC has been restored to operation.

### 5.2.5 Locust Point Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2290 E. Fort Avenue, Baltimore. Access is via E. McComas Street to East Fort. Go through the security gate and continue 425 feet. Turn right around the salt pile and continue for 260 feet to a brick structure.

**Table 5-7: Locust Point Pumping Station Data**

Locust Point Station	
Station Address:	2290 East Fort Avenue, Baltimore MD 21230
Station Telephone No.	(410) 396-7290
First Likely SSO Point	First manhole in front of the station
Storage Capacity	Approximately 45,000 gallons (wetwell); limited in-line storage
Est. Generator Run Time:	Approximately 2-1/2 days
Influent Flow Rate	Estimated Storage Time
Minimum: approximately 23,000 GPD <sup>a</sup>	Approximately 6 hours
Average: approximately 131,000 GPD	Approximately 4 hours
Maximum: 3.0 MGD	Approximately 1 hour

<sup>a</sup> GPD – gallons per day.

- **Note:** Transportation Worker Identification Card required for site access.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm visible outside the station.
- **Pump:** Two alternating dry-pit submersible pumps. Any one pump has firm capacity to operate the station.
- **Emergency bypass availability:** Portable pumps can be used to pump from wetwell to the nearest gravity sewer manhole. The wetwell may be accessed from outside the station at the wetwell hatch. However, bypassing the entire station using portable pumps is feasible. If the 10-inch force main is operational, a portable bypass pump may be discharged to a tee fitting installed on the force main on the pump deck. This will require a 6 inch 150# connection to the flange.
- **Likely collection system overflow point:** Gravity manhole immediately north and in front of the station.

#### Electrical Fault

1. Does the station have power?

- Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of any or all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Locust Point Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
    - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for auxiliary equipment are also located at the MCC.
    - The pump motor soft starters may be manually bypassed.

### **Mechanical Fault**

1. Is the drywell flooded?
  - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
  - Because the Locust Point Station has no screening for solids, investigate possible ragging of the pump volute, discharge line, or check valves.
  - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.
3. Is there a low wetwell alarm, with or without a collection system SSO?
  - Verify the 12-inch wetwell isolation sluice gate is in the open position. If there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Locust Point Station O&M Manual for troubleshooting and repair of specific systems. *Note that a failure*

*of the bubble tube level control system will disable this station. Any pump may be started manually at the MCC if the bubbler tube system is not operating.*

The Locust Point Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Locust Point Station local control is provided by the station PLC. This system has multiple redundant features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

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## 5.2.6 Quad Avenue Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 701 S. North Point Road, Baltimore. Brick structure on the north side of Quad Avenue at the intersection of North Point Boulevard.

**Table 5-8: Quad Avenue Pumping Station Data**

Quad Avenue Station	
Station Address:	701 S. North Point Road, Baltimore, MD 21224
Station Telephone No.	(410) 396-6077
First Likely SSO Point	62nd Street, Moore's Run side, and past the 62nd Street pumping station
Storage Capacity	Approximately 150,000 gallons; including in-line storage
Est. Generator Run Time:	Approximately 1-1/2 days
Influent Flow Rate	Estimated Storage Time
Minimum: 2.21 MGD	Approximately 1 hour 15 minutes
Average: 2.40 MGD	Approximately 1 hour
Maximum: 24.2 MGD <sup>a</sup>	Approximately 9 minutes

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two pumps and third standby/wet weather pump available.
- **Force main failure:** A 20-inch bypass connection is provided on pump discharge manifold for connection to temporary piping. A temporary force main may not be an option due to the distance to the nearest gravity sewer manhole (approximately 1 mile west of the station on North Point Boulevard).
- **Emergency bypass availability:** Portable pump discharge line can be connected to the 20-inch flanged bypass connection on pump discharge outside the station.
- **Likely collection system overflow point:** First SSO will occur from a manhole located on the Moore's Run low level interceptor at 62nd Street.

### Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency

situation involving loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer load using the controls on the ATS. This procedure is described in the Quad Avenue Station O&M Manual.

2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and bubbler wetwell level controls are disabled, pumps can be started manually at the VFDs as long as three-phase power is available at the MCC.
  - Check for power for single-phase 120-volt loads at Panel A.
  - Attempt manual start of any one pump.
  - After starting pump, verify that the pump cone valve has opened.

### **Mechanical Fault**

1. Is the drywell flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - Check that the dry well pump out valve is closed.
  - The drywell may also be dewatered by opening the dry well pump out valve and manually starting Pump #1.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wetwell level control systems. If both are inoperative, sewage pumps may be started manually at the VFDs.
  - If the pump motors are running, investigate valve positions, including the pump cone valves. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.
3. Is there a low wetwell alarm, with or without a collection system SSO?
  - Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Quad Avenue Station O&M Manual.
  - Bypass the screening channel only as a last resort. Solids in unscreened wastewater will eventually cause ragging of the pump volutes and pump failure.
  - If the bar screen is operating and there is low flow in the influent channel, investigate both upstream gravity interceptor sewers for a break or obstruction.

**Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Quad Avenue Station O&M Manual for troubleshooting and repair of specific systems.

The Quad Avenue Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Quad Avenue Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wetwell level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.



### 5.2.7 McComas Street Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 1800 Key Highway, Baltimore. One story brick structure located under the overpass of Rt. 95 north, near the intersection of Key Highway and E. McComas Street.

**Table 5-9: McComas Street Pumping Station Data**

McComas Street Station	
Station Address:	1800 Key Highway, Baltimore MD 21230
Station Telephone No.	(410) 396-3449
First Likely SSO Point	BG&E grass area near the marine terminal
Storage Capacity	Approximately 21,000 gallons (wetwell); limited in-line storage
Est. Generator Run Time:	Approximately 3-1/2 days continuous service
Influent Flow Rate <sup>a</sup>	Estimated Storage Time
Minimum: approximately 20,000 GPD	Approximately 5 hours
Average: approximately 47,000 GPD	Approximately 3 hours
Maximum: approximately 443,000 GPD <sup>a</sup>	Approximately 1 hour

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm/gas concentrations visible outside the station.
- **Pumps:** Two duty and one standby/ wet weather pumps are available. All units are identical submersible dry-pit pumps. **Note:** Although the pumps are fully submersible, their electrical connections are not. Flooding of the drywell to a depth of 6 feet or greater will likely disable all three sewage pumps.
- **Force main:** Two parallel force mains (6 inch and 10 inch) discharging to the same point are available. The 10-inch force main is normally in service, with chain-operated valves located on the pump deck.
- **Emergency bypass availability:** A 6-inch emergency bypass connection is provided on the 6-inch force main outside the pump station. The nearest gravity sewer is located on Key Highway approximately 900 feet from the station. The wetwell can be dewatered by vacuum truck by removing the trash basket from the hatch immediately outside the station.
- **Likely collection system overflow point:** The BG&E property, grass area near the Marine Terminal.

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 208 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of any or all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the McComas Street Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for 120-volt auxiliary equipment are also located at the MCC.
  - The pump motor soft starters may be manually bypassed in the event of drive fault.

## Mechanical Fault

1. Is the drywell flooded?
  - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - Inspect the pump electrical junction boxes on the pump deck. If these have been submerged, do not attempt to start the sewage pumps until these connections have been inspected by a qualified electrician. If it is not possible to restart the sewage pumps without extensive electrical repairs, begin the provision of temporary bypass pumping using portable pumps.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
  - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.

3. Is there a low wetwell alarm, with or without a collection system SSO?
  - Investigate the trash basket outside the station. Lift using the hand winch and remove solids as necessary. In an emergency, the station may be operated with the trash basket removed, but this will eventually lead to obstruction of the pump volutes and discharge lines with solids.
  - If the trash basket is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

#### Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the McComas Station O&M Manual for troubleshooting and repair of specific systems. *Note that a failure of the bubble tube level control system will disable this station.* The wetwell floats are for alarm only, and will not operate the sewage pumps. Any pump may be started manually at the MCC if the bubbler tube system is not operating.

The McComas Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

McComas Station local control is provided by the station PLC. This system has multiple redundant features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.8 Westport Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2911 Waterview Ave, Baltimore. On Waterview, at intersection of Cherry Hill Road. One story brick structure on the north side of the intersection.

**Table 5-10: Westport Pumping Station Data**

Westport Station	
Station Address:	2911 Waterview Ave. Baltimore MD 21230
Station Telephone No.	(410) 396-7289
First Likely SSO Point	Wetwell, flowing to storm drain on Waterview Ave
Storage Capacity	Approximately 10,500 gallons (wetwell); limited in-line storage
Est. Generator Run Time:	2 to 2-1/2 days Continuous service
Influent Flow Rate	Estimated Storage Time
Minimum: 50,000 GPD	Approximately 4 hours
Average: 77,500 GPD	Approximately 3 hours
Maximum: 134,000 GPD <sup>a</sup>	Approximately 1.5 hours

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two duty and one standby/wet weather pumps are available. All units are identical submersible dry-pit pumps.
- **Force main:** Station has a very short (~200-foot) force main, discharging to a structure on the southwest corner of Waterview Avenue and Cherry Hill Road. It is feasible to provide portable pumping and a temporary force main.
- **Emergency bypass availability:** Emergency bypass connection is not available on the force main. Because of the very short force main, a portable pump and bypass hose could be deployed. The bypass hose would need to cross Waterview Ave, so some means of protection (road plates, etc.) would be required. A police traffic detail would be required to implement this plan.
- **Likely collection system overflow point:** The station wetwell and the first gravity manhole structure upstream of the station (located immediately south of the station within the fence).

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking the metering on the ATS or MCC. Voltage should read 480 volts +/- on all three phases.
  - If power is not present on all three phases, immediately request an electrician to respond. Loss of any or all phases should automatically start the station generator and transfer load.
  - It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Westport Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for auxiliary equipment are also located at the MCC. The pump motor soft starters may be manually bypassed.

## Mechanical Fault

1. Is the drywell flooded?
  - Using a portable gas detector, go below and inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak.
  - If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
  - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.
3. Is there a low wetwell alarm, with or without a collection system SSO?
  - Investigate the bar screen. If it is fouled and not operating, first check the bar screen circuit breaker at the MCC. In an emergency, the screen channel may be bypassed directly to the wetwell. This procedure is described in the Westport Station O&M Manual.

- If the bar screen is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Westport Station O&M Manual for troubleshooting and repair of specific systems.

The Westport Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Westport Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wetwell level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.9 Stony Run Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2842 Sisson Street, Baltimore. Southwest corner of Sisson and W. 29th Streets. Access station via solid waste transfer facility driveway on 2840 Sisson St.

**Table 5-11: Stony Run Pumping Station Data**

Stony Run Station	
Station Address:	2842 Sisson Street, Baltimore MD 21211
Station Telephone No.	(410) 243-1326
First Likely SSO Point	None: station bypasses by gravity
Storage Capacity	Approximately 20,000 gallons (wet well); 210,000 gallons (in-line storage)
Est. Generator Run Time:	Approximately 11 hours
Influent Flow Rate <sup>a</sup>	Estimated Storage Time
Minimum: 3.0 MGD	N/A <sup>a</sup>
Average: 7.0 MGD	N/A <sup>a</sup>
Maximum: 17.0 MGD	Approximately 20 minutes <sup>b</sup>

<sup>a</sup> The Station is a wet-weather Station and during dry weather all incoming flow passes (by gravity) through the 24-inch Lower Stoney Run Interceptor to Lower Jones Falls Interceptor.

<sup>b</sup> This storage time is reflects a condition when the gate valve on 24-inch Lower Stoney Run Interceptor is closed and no flow passes through the Station. If the gate valve is open, the Station will not cause overflow upstream, rather the overflow may be downstream from Lower Jones Falls Interceptor.

- **Note:** During wet weather, station can receive flows from the 60-inch Stony Run Interceptor sewer and pump to the Jones Fall force main. Dry-weather flows normally bypass station west to the 24-inch Stony Run Interceptor.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pump:** Four pumps are available—two pumps provide station capacity of 17 MGD.
- **Force main failure:** Station can safely remain off-line in dry-weather conditions. Bypass connection not provided on the station force main.
- **Emergency bypass availability:** Station can be bypassed by gravity. In an emergency the wetwell could be dewatered (using portable pumps) to the gravity manhole on the 24-inch Stony Run interceptor approximately 25 feet west of the station concrete apron.
- **Likely collection system overflow point:** During very high wet-weather flows, structures along the Falls Road Interceptor may surcharge. There have been no known overflows from upstream collection system manholes.

## Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Stony Run O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and float switch wetwell level controls are disabled, pumps can be started manually at the VFDs as long as three-phase power is available at the MCC. Before manually starting any pump, verify the pump volute is full of water by first cracking the 1-inch ball air release valve. After starting pump, verify that the pump plug valve has opened.
  - Check for power for single-phase 120 V loads at Panel 1. Loss of power to the PLC and related instrumentation will disable the station.

## Mechanical Fault

1. Is the drywell flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, first isolate the wetwell using the electrically operated sluice gate. Pumps #1 and #4 are furnished with drywell dewatering connections on the suction side of these pumps. See the station O&M manual for valve positions required to dewater the wetwell. In the event the suction side valves are submerged, it may be necessary to dewater the drywell using portable pumps.
  - Inspect the surge valve and related piping. A leak or break in this equipment could flood the drywell.
  - Check the 6-inch suction line valves on Pumps #1 and #2 for breakage or leaks. This piping is cantilevered off the individual pump suction lines, and represents a potential failure point.
2. Is there a high wetwell alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wetwell level



control systems. If both are inoperative, sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate valve positions, including the pump plug valves.

- First, check that the operating pumps are primed by slightly cracking the pump volute air release valve. Investigate suction line obstructions or breaks (uncommon, but possible). Attempt to return at least one pump to service.

3. Is there a low wetwell alarm, with or without a collection system SSO?

- Investigate the grinder channels. If one or the other is fouled or otherwise inoperative and cannot promptly be returned to service, see the Stony Run Station O&M Manual for maintenance procedures.
- If the grinder(s) are operating and there is low flow in the influent channel, investigate the 60-inch upstream gravity interceptor sewer for a break. Because of the large diameter and high wet-weather flow in the interceptor, an obstruction would be unlikely.

### Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Stony Run Station O&M Manual for troubleshooting and repair of specific systems.

The Stony Run Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Stony Run Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will not operate. In this case it is possible to operate the pumps manually via the VFD controls, with the understanding that the pumps are not operating under automatic wetwell level control.

## 5.3 Response Guide for Force Main Emergencies

The purpose of this section is a guide to initiating an effective and timely response to situations common to operating sewage force mains. It is provided as general guidance and to help ensure an adequate response in emergency situations that cannot be anticipated or predicted.

Sewage force main failures have the potential to threaten human health and the environment and cause significant property damage. Force main failures can create a large SSO in a short period of time and have the potential to affect a larger section of the sewer service area than a gravity sewer blockage. Response to a force main failure may call upon every operational group within the DPW having responsibility for O&M of the collection system, including the wastewater treatment plants.

Force main failure may result in serious spills requiring isolation of the force main segment to permit repair. In some cases, more than one pump station may be affected when a force main segment is taken out of service. The isolation of a damaged force main segment for repairs and

the rerouting of normal sewage flow requires shutdown of affected pump stations and the closing and opening of key valves at pump stations and on the force main segment to be isolated. This situation requires extremely careful planning of force main segment isolation procedures, affected pump station shutdown procedures, SSO containment/cleanup, and expeditious repair of the force main.

Force main failures can result from a variety of causes including accidental damage from excavation activities, pipe age, subsidence or washout of backfill, hydraulic surge, corrosion, or (most commonly) failure at an air release valve (ARV) or buried fitting. Some actions that can be taken prior to an emergency include:

- Ensure that a qualified DPW representative is on site during any excavation by other City departments or private contractors taking place in the vicinity of gravity sewers or force mains.
- Organize and store emergency force main repair kits consisting of at least two lengths of pipe of the same material and diameter as the force main, along with several repair sleeves, couplings, restraining rods with hardware, etc. This ensures repair materials are available in the event of an emergency.
- Regularly inspect ARV structures, and verify that each ARV is furnished with an operating ball valve installed in series with the ARV. Remember that ARVs that become “stuck open” are the primary cause of most force main SSOs.

## **6.0 WATER QUALITY SAMPLING AND MONITORING**

### **6.1 General Information**

In the event of a confirmed SSO of 10,000 gallons or greater, or as otherwise directed by the Bureau Head, BCHD, EPA, or MDE, OCAL will implement monitoring, sampling, and analysis to assess and report the impact of the SSO on receiving water quality. OCAL's sampling and monitoring will determine if receiving waters have been adversely impacted by the SSO, i.e., whether there is any decrease in background levels of dissolved oxygen and any increase in background levels of turbidity, fecal coliform, total coliform, or other applicable bacteriological standards.

The presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water and posts temporary SSO notification signs to this effect. In addition, there are no designated locations in Baltimore City for full-body contact recreation in surface water. If City recreation programs may involve infrequent water contact, such as kayaking, participants are provided appropriate educational materials. Similar messages are also disseminated on City websites.

The SSO sampling program supplements ongoing monitoring programs conducted by the City under its National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System permit, specifically, the Ammonia Screening (AS) and Stream Impact Sampling (SIS) programs. The AS program consists of weekly surface water monitoring at over 80 locations throughout the City, using field test kits for ammonia-nitrogen, chlorine, pH, temperature, dissolved oxygen, and conductivity. The SIS program consists of monthly surface water sampling at over 30 locations within the City, using laboratory analysis for nutrients, sediment, bacteria, metals, and other water quality indicators. The SIS program has been ongoing since 1997, and the AS program has been ongoing since 1998. The results of the AS and SIS programs provide background levels for turbidity, dissolved oxygen, and bacteria. Additional information regarding these programs and their historical sampling results is available online through DPW's website.

### **6.2 Water Quality Monitoring**

In the event that an SSO is confirmed to meet or exceed 10,000 gallons, the Wastewater General Superintendent will notify the OCAL Water Quality Monitoring and Investigation (WQMI) Section to initiate SSO sampling. Upon notice, the OCAL-WQMI Section Chief will initiate water quality sampling according to the procedures specified herein. The OCAL-WQMI Section Chief will act as the point of contact for the sampling event; provide coordination for laboratory analysis; and designate a field coordinator to oversee collection of samples.

## 6.3 Sampling Protocol

### 6.3.1 Sample Parameters

Samples collected as part of a response to an overflow event will be grab samples. Sampling parameters shall include:

- Field sampling:
  - Dissolved oxygen per Standard Method (SM) D988(C).
  - Turbidity per SM 2130 B.
- Laboratory analysis (reference 40 CFR 136):
  - 5-day biochemical oxygen demand (BOD) per SM 5210B.
  - Total suspended solids (TSS) per SM 2540.
  - Bacteriological standard:
    - E-coli most probable number (MPN) count for non-tidal receiving waters per SM 9223 B; or
    - Enterococci MPN count for tidal receiving waters per SM 9230 D.

A Chain of Custody record shall accompany all samples for laboratory analysis. All samples collected will be identified on the Chain of Custody record with the sample date, time, volume, sampler, parameters to be analyzed, and the sample receiver.

All samples requiring laboratory analysis will be transported to the laboratory as soon as possible in coolers with ice and preserved according to the analytical method. Sample analyses will be performed within specified holding times for specific parameters. The holding time for bacteria (6 hours) is most critical. Sampling may be limited by laboratory operation times; therefore, late afternoon sampling events should be limited. The laboratory shall indicate on the results records any analysis performed outside of the specified holding time.

### 6.3.2 Location and Schedule of Sampling

Sampling locations and schedule will be based on the Collection System asset that is overflowing, the receiving water, and the duration of the SSO event (i.e., if an SSO is not abated within 5 days). The sampling protocols are summarized in Table 6-1:

**Table 6-1: Summary of Sampling Protocols**

Protocol Type	Collection System Asset	Receiving water	Sampling Location	Frequency
1	Structured overflow	Any	Outfall <sup>a,b</sup>	Within 1 working day of notification
2	All other assets	Tidal	Outfall <sup>c</sup>	Within 1 working day of notification; and within 2 working days after abatement

Protocol Type	Collection System Asset	Receiving water	Sampling Location	Frequency
3	All other assets	Non-tidal	Outfall, <sup>a</sup> upstream (200 feet), and downstream (minimum 200 feet)	<p>Within 1 working day of notification</p> <p>Two working days after the first sampling event</p> <p>Weekly from the first sampling event until the SSO abatement is complete</p> <p>Five working days after the SSO abatement is complete.</p>

- <sup>a</sup> Sample should be obtained from the flow within the outfall pipe. If no base flow is available, then sample the surface water at the outfall. If the outfall is not accessible, sample can be obtained from the surface water at the nearest accessible downstream location.
- <sup>b</sup> Surface waters at SSO structures typically discharging more than 10,000 gallons during an SSO are usually sampled as part of the SIS program.
- <sup>c</sup> If the outfall is not accessible, the sample may be obtained from the base flow within the pipe at the nearest upstream manhole as long as it is downstream from the SSO discharge to the storm system. Samples may be obtained from the tidal surface water at submerged outfalls.

### 6.3.3 Quality Assurance/Quality Control

All laboratories analyzing samples collected as part of this SSO monitoring shall have a current MDE-approved quality assurance plan and follow approved procedures for all analyses. The following quality assurance/quality control (QA/QC) samples shall be obtained and analyzed as follows:

- Duplicate samples shall be obtained from the same discrete sampling location throughout the SSO sampling duration and analyzed for bacteria and TSS. The precision of the method of analysis can be determined by the reproducibility of the results from the duplicate samples measured by the standard deviation of the duplicate samples.
- Blank samples shall consist of distilled water and shall be carried in the same cooler as the other surface water samples. One blank sample should be submitted for each qualifying SSO event and analyzed for bacteria and TSS. Blank samples should also be sampled in the field for turbidity. Blank samples should result in known values.

QA/QC samples shall be uniquely labeled and noted on the original field sheets. These samples will be submitted on the same Chain of Custody form as the other samples.

## 6.4 Reporting

Test results and analyses conducted pursuant to this ERP will be maintained by OCAL and reported to EPA and MDE as provided below. The laboratory will ordinarily provide a final, written report within 10 working days of receiving samples. Within 14 days of receipt of the laboratory report, the OCAL-WQMI Section Chief will complete a written report that includes the following:

- Data from the 5-Day Report to MDE:
  - SSO identification number;
  - Location of the SSO event;
  - Notification date and abatement date of SSO event;
  - Total SSO volume; and
  - Receiving water (8-digit watershed).
- Collection System asset (SSO Structure, etc.)
- Discharge location (outfall asset and tidal / non-tidal).
- If applicable, any deviation from the sampling protocol, and the reason(s) why.
- Summary table of laboratory results (including dates and locations).
- Evaluation of QA/QC sample results.
- Reference AS and SIS sampling locations, comparison to baseline conditions, and assessment of impact from the SSO event.
- Sampling location map.
- Chain of custody records.
- Field sampling records.
- Laboratory results.

## 7.0 PREPAREDNESS TRAINING

The Preparedness Training Program was developed to familiarize appropriate personnel with the guidelines, procedures, and requirements for responding to emergencies within the Collection System. The training program ensures the preparedness of response and call center personnel by providing a detailed overview of the City's response procedures for sewage backup investigations, Building Backups, SSOs, and call center customer service guidelines.

Preparedness training for UMD personnel includes public safety awareness and sewage containment with response times, SSO response, overflow reports, and steps to prevent future SSOs. Additionally, UMD, Control One, and other DPW offices with related responsibilities participate in annual refresher training focused on the requirements of the City's ERP.

Lesson plans are included in Tables 7-1, 7-2, and 7-3.

**Table 7-1: Preparedness Training—ERP**

<b>Purpose</b>	To provide management and response personnel with an understanding of the ERP.
<b>Duration</b>	4 hours
<b>Objective</b>	<p>At the conclusion of this training program, the participants should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the requirements of Paragraph 16 of the MCD</li> <li>• Interpret the contents of the ERP</li> <li>• Locate and identify those specific actions and procedures necessary to implement the plan in a timely and effective manner</li> <li>• Understand response priorities and chain of command</li> <li>• Identify specific individuals and their responsibilities</li> <li>• Identify resources and their locations</li> </ul>
<b>Audience</b>	Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Pollution Control Analysts; Public Information Officers; as appropriate, employees from the following Offices in DPW: Office of Asset Management, Office of Engineering and Construction, Office of Compliance and Laboratories, Control One; Baltimore City Health Department.
<b>Training Aids</b>	Handouts and PowerPoint presentations
<b>References</b>	ERP
<b>Topics</b>	<ul style="list-style-type: none"> <li>• Overview of the ERP</li> <li>• Review decision charts</li> <li>• Internal notification procedures</li> <li>• SDUO notification procedures</li> <li>• Pumping station emergency response procedures</li> <li>• Force main emergency response procedures</li> <li>• Siphon emergency response procedures with locations of blow-offs</li> <li>• Collection System emergency response procedures</li> <li>• Water quality sampling and monitoring</li> <li>• Public notification procedures</li> <li>• Incident reporting and documentation</li> </ul>



**Table 7-2: Preparedness Training—Sanitary Sewer Overflows**

<b>Purpose</b>	To familiarize participants with the SOP for investigating, abating, reporting, and following up on SSOs.
<b>Duration</b>	Four hours
<b>Objective</b>	At the end of the class, participants will be able to utilize the procedures in the SOP effectively when dealing with SSOs.
<b>Audience</b>	Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Pollution Control Analysts; Public Information Officers; as appropriate, employees from the following Offices in DPW: Office of Asset Management, Office of Engineering and Construction, Office of Compliance and Laboratories, Control One; Baltimore City Health Department.
<b>Training Aids</b>	Handouts and PowerPoint presentation
<b>References</b>	ERP Sections 5 through 7
<b>Topics</b>	<ul style="list-style-type: none"> <li>• Understanding the SOP</li> <li>• Fielding the complaint from citizens</li> <li>• Creating SRs</li> <li>• Dispatching work to crews</li> <li>• Creating Work Orders</li> <li>• Notifying the appropriate regulatory agencies with preliminary SSO information and potential impacts</li> <li>• Protecting public health and establishing SSO perimeters and control zones</li> <li>• Containing the SSO</li> <li>• Follow-up investigations and preventative steps</li> <li>• Estimating SSO flow and volume</li> <li>• Establishing an SSO timeline for the duration of the event</li> </ul>

**Table 7-3: Preparedness Training—Building Backups**

<b>Purpose</b>	To familiarize participants with the SOP for investigating, abating, reporting, and following up on Building Backups.
<b>Duration</b>	Four hours
<b>Objective</b>	At the end of the class, participants will be able to use the requirements of the SOP when investigating and addressing Building Backups.
<b>Audience</b>	Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Public Information Officers; as appropriate, employees from the following Offices in DPW: Office of Asset Management, Office of Engineering and Construction, Control One; Baltimore City Health Department.
<b>Training Aids</b>	Handouts and PowerPoint presentation
<b>References</b>	ERP Section 3
<b>Topics</b>	<ul style="list-style-type: none"> <li>• Understanding the SOP</li> <li>• Fielding the complaint from citizens</li> <li>• Creating SRs</li> <li>• Distribution of informational material during investigations</li> <li>• Dispatching work to crews</li> <li>• Creating Work Orders</li> <li>• Addressing acute or catastrophic failures in Collection System laterals</li> <li>• Protecting public health and providing customers with useful information</li> </ul>

## 8.0 DOCUMENT CONTROL

This section describes the standard procedure(s) for control, periodic evaluation, and revision of the ERP.

### 8.1 Emergency Response Plan Locations

Copies of the ERP are issued to a number of specific users, as outlined below. The number of copies is limited to the extent possible in order to facilitate document control and revision.

#### 8.1.1 Working Copies

A complete set of the ERP and all appendices will be maintained at the following locations as a hard copy and in electronic format:

- Park Terminal
- West Side Maintenance Yard
- East Side Maintenance Yard
- All Pumping Stations
- Treatment Plants (Back River and Patapsco)
- Office of Legal and Regulatory Affairs at Abel Wolman Building

#### 8.1.2 Executive and Managers Copies

Complete copies of the ERP will be issued to a number of City managers who may be directly involved with an emergency response. These include:

- Chief of Staff, Mayor's Office
- Director, Department of Public Works
- Bureau Head, Bureau of Water & Wastewater
- Division Chief, Communications & Community Affairs
- Division Chief, Utility Maintenance
- Chief, Office of Compliance and Laboratories
- Chief, Office of Engineering and Construction
- Chief, Office of Asset Management
- Division Chief, Information Technology
- Section Head, Water Quality Monitoring and Illicit Discharge Detection and Elimination
- Operations Manager, Wastewater Pumping Stations

- Operations Supervisor, Wastewater Pumping Stations
- Wastewater General Superintendent, Utility Maintenance Division
- Managers, Back River and Patapsco Treatment Plants

## **8.2 Document Control**

Hard copies and electronic copies of the ERP, and subsequent revisions thereto, are provided to those listed in Section 8.1.2. Each plan holder is responsible for maintaining their respective copy and incorporating revisions as they are issued, typically annually. A non-editable electronic version of the complete and up-to-date ERP is also provided annually.

## **8.3 Emergency Response Plan Review and Revisions**

The ERP is subject to periodic reviews and revisions. Revisions will be necessary to reflect changes in policy, regulatory requirements, response personnel, or facilities, or to capture improvements to emergency response procedures. Although revisions may be issued at any time to incorporate significant or urgent changes, the ERP undergoes a formal review on an annual basis and stays in effect until the annual review has been approved.

Maintenance of the ERP and issuance of revisions are the responsibility of the Chief of OAM. All noted corrections, requested changes or information to be added or deleted to the ERP should be reported to Chief of OAM for inclusion in the next revision. The Chief of OAM conducts the annual review of the ERP in consultation with all users.

All pages, charts, maps, etc. included in the ERP are numbered, dated and noted with a revision number. Any sections affected by a revision will be appropriately noted, and the Chief of OAM will circulate copies of these revised pages to all plan holders.